CASE STUDY

**ROAD-SCANNER4**

*Mobile Mapping System by GEXCEL & SITECO collaboration*

The complete mobile system for asset management and cartography suited for **ZOLLER & FRÖHLICH PROFILER® 9012** laser scanner.

**SUGGESTED CONFIGURATION**

1. INS/GNSS (Inertial Measurement Units; Odometer; Applanix AP20-1)
2. Ladybug5 360° spherical camera
3. Two support arms for laser scanner
4. In case of one sensor usage the support arm will be oriented along the ride direction

**Performance and Accuracy of SUGGESTED configuration**

<table>
<thead>
<tr>
<th>SCANNING SPEED</th>
<th>Up to 1 Million points per second</th>
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</thead>
<tbody>
<tr>
<td>LIDAR ACCURACY</td>
<td>± 0.5 ± 1 mm</td>
</tr>
<tr>
<td>GNSS POSITIONING SYSTEM ACCURACY</td>
<td>&lt; 2 cm (with GCPs)</td>
</tr>
<tr>
<td>DISTANCE RANGE</td>
<td>119 m</td>
</tr>
<tr>
<td>SCANNING FREQUENCY</td>
<td>50 Hz up to 200 Hz</td>
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</tbody>
</table>
| INS SPECIFICATIONS | Number of Antenna: 1  
                        | Drift rate: ± 1 °/h  
                        | Sampling rate: 200 Hz |

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### SUGGESTED CONFIGURATION

| LASER SCANNER* | 2 support arms available for Zoller & Fröhlich PROFILER®  
|                | [suggested] 1 laser scanner Zoller & Fröhlich PROFILER®  
|                | *laser scanner not included  

| INS/GNSS        | - Inertial Navigation System with 1 L1/L2 GNSS receiver and antenna  
|                 | - Inertial Measurement Units (IMU) and odometer  
|                 | - Applanix AP20  

| CAMERA          | High-Res Imagery PointGrey Ladybug5 360° spherical camera  
|                 | 5MP x 6 sensors | 2048 x 2448 at 10 FPS  

| SOFTWARE        | - On board real-time acquisition (Road-SIT RT)  
|                 | - Post-processing (Road-SIT PP + POSPac MMS Applanix)  
|                 | - Features extraction (Road-SIT Survey)  
|                 | - AutoCAD® connection (Road-SIT Survey plug-in for AutoCAD®)  
|                 | - ArcGIS® connection (Road-SIT plug-in for ArcGIS®)  

| WARRANTY        | 1 year of hardware and software support  

### ADD-ON COMPONENTS

| INS/GNSS        | - iXBlue ATLANS  
|                 | - One more antenna (for Applanix AP20 & AP40)  
|                 | - Applanix AP40 or AP50  

| More performance: |  
| • Drift rate: up to ± 0.15 °/h  
| • GNSS positioning system accuracy: up to 1 cm  

| CAMERA          | Camera bar with up to 5 cameras (x2Mpx or x4Mpx)  

| SOFTWARE        | - Roads and Airports (Road-SIT Pavement Management System)  
|                 | - Road Inventory & Asset Management (Road-SIT Asset Management)  
|                 | - Railway (Rail-SIT Inspection and Analysis)  
|                 | - Volumes & Isolines (JRC 3D Reconstructor®)  
|                 | - Huge point clouds management | Solid Images (PointR3)  

| WARRANTY        | Yearly renewal  

Hardware warranty extendible for a maximum of 3 one-year periods
ON BOARD REAL-TIME ACQUISITION
(Road-SIT RT)

Real time acquisition software to acquire data produced from any Road-Scanner4 model.

- Real-time acquisition
- Survey monitoring: accuracy and quality of images, point clouds, trajectories
POST-PROCESSING
(Road-SIT PP + POSPac MMS Applanix)

Road-SIT Post-Processing Siteco’s software for computing data produced from any Road-Scanner4 model.

POSPac Mobile Mapping Suite Applanix’s industry-leading software for Direct Georeferencing of mobile mapping sensors using GNSS and inertial technology.

- First post-processing
- Computing of acquired data (point clouds, imagery and positions)
FEATURES EXTRACTION
(Road-SIT Survey)

Editing of geodatabase from road information system and producing of as-built drawings, hi-grade mapping, infrastructure analysis, and so on.

- Mobile mapping data management
- Cartography application
- Ground control point calibration for trajectories correction
- Geodatabase of road information system editing
- Combined navigation between spherical images and point clouds (also slice views)
- Photogrammetric measurements and snapping tools to laser points
- Drawing on 2D/3D maps: feature extraction, plane detection, cross sections, edge detection
- Point clouds, drawings and orthophotos exporting

+ AutoCAD® connection (Road-SIT Survey plug-in for AutoCAD®)
+ ArcGIS® connection (Road-SIT plug-in for ArcGIS®)
Add-on Software

ROAD INVENTORY & ASSET MANAGEMENT
(Road-SIT Asset Management)

GIS application for roadside assets extraction and management

- From Mobile Mapping to Geodatabase
- Compatibility with the most popular databases
- Association between assets and external documents
- Consultation of the Mobile Mapping data
- Technical/Administrative sign management (by catalogues and reports)
- Permits, authorizations and licensing management
- Facility and maintenance management
ROADS and AIRPORTS
(Road-SIT Pavement Management System)

Suited for airports and fully integrated with the latest equipment targeted to satisfy and implement the requirements of the airport regulations.

- Defect classification and PCI calculation
- Full integration with the ESRI ArcGIS system for a complete control of all data collection and maintenance activities in their mapping context
- Infrastructure organization
- Integration with other inspection equipments and data
- Decision support system
- Analysis, queries and reports
RAILWAY

(Rail-SIT Inspection and Analysis)

*The application for complete railway inspection and analysis of infrastructure status. Highly Automated Detection of Rail Geometry and Interferences, starting from railroad surveyed data through Mobile Mapping Systems.*

- Rail line inspection with mobile mapping systems
- Railhead detection, automated track and cantenary geometry generation
- Dynamic generation of clearance outlines and interference calculation
- Checks and inspections, anchoring/fixing the end track position
- Tunnel inspection with cylindrical views of the tunnel vaults
- Automatic generation of documents and reports

A user-friendly interface provides the tools to manage inspections and point clouds, make selections, display the cylindrical views, obtain realistic representations (3D view), thus allowing users to check and keep the infrastructure status under control.
Add-on Software

VOLUMES, ISOLINES
(JRC 3D Reconstructor® MINING)

The worldwide well known and appreciated software to manage point clouds and images coming from different lidar and imaging platforms.

- Raw data import from different lidar sensors (terrestrial, airborne, mobile), UAV, DTM
- Advanced data filtering
- Scans alignment and geo-referencing
- DTM creation
- Geotiff from airborne or UAV supported
- Data extraction: cut&fill volumes, crests&toes, isolines, slope monitoring and change detections
- Specific tools for tunneling
- Export to CAD (for mine breaklines)
- Output: point cloud models; DTM; plans; orthographic/cylindrical/spherical/perspective 2.5D views (virtual scan); isolines; cross sections (also along tunnel axis); crests&toes; volume and cut and fill volume; deformation and displacement maps; points surfaces comparisons (inspection); 2D view of cylindrical surfaces for tunnel inspections; fly-through videos
HUGE POINT CLOUDS, SOLID IMAGES
(PointR³)

Perfect for airborne, UAV, mobile and bathymetric applications.
Ideal for construction, architecture, heritage, mine, forensic, sonar and geophysical surveys.

- Extremely simple interface with few buttons, integrated workflows and self-explainable wizards for data processing.
- Handling of 3D unlimited point clouds coming form lidar data, 3D sensors and photogrammetry.
- Management and navigation of 3D point cloud huge datasets.
- Points visualization with height and distance map coloration (useful for points and objects classification).
- Solid Images special tool to create images with depth information ready to be directly export to CAD (through the gexcel CAD Plug-in) and re-drawn with 3D polylines.
- Output: ortophotos and Solid Images (with direct export to CAD); elevations; plans; 3D models; fly-through videos with large dataset; planarity maps; linear distances; annotations and coordinates.
SOFTWARE AND SYSTEM SUPPORT

1 year included in the package purchase

- Free email and phone support about application, software usage and result analysis
- Customer support telephone Hot line
- Test and diagnostics for all the equipment provided
- Free bug fixes within the same version level (e.g. 1.2 to 1.3)
- Free software release upgrades
- Support will be given by Siteco-trained and authorized personnel only
- Does not include data processing of customer data

HARDWARE WARRANTY

1 year included in the package purchase

- All electrical and mechanical equipment, cables and accessories
- Free repair or replacement of defective hardware components
- Interim, no-charge supply of equivalent demonstration components while the customer’s system is repaired
- Includes all labor and parts as well as adjustment or recalibration, if required

EXTENDED WARRANTY

- Yearly renewal
- Hardware Warranty can be extended for a maximum of 3 one-year periods
- Same services as Software and System Support and Hardware Warranty